

210 Grams?

The other day I ran into a gem hunter, a rock hound if you would. He told me that there is no such thing as matter, that is, everything is really just energy. His statement was in regard to his spiritual belief that everything (energy) can be manipulated by his spiritual practices and teachings. Well, for someone that is a self proclaimed "gemologist" I thought this to be a rather strange claim, for how do you differentiate between or among gems other than by their chemical and physical properties such as; hardness, color, cleavage, reactivity, density, solubility, conductivity, specific heat, smell, malleability etc.

It is true that energy can be converted into matter and matter into energy however, because of their different properties we (humans) have classified them to be separate fundamental entities in science. First of all matter consists of one to many fundamental particles that have mass, produce a gravitational field, and can be identified by one or more of the physical properties described above. Energy on the other hand does not have mass and cannot be identified by physical and chemical properties. Lets look at Einsteins equation: $E = m c^2$.

$E = m c^2$ comes from Einsteins theory of special relativity, The full form of the equation is $E^2 = (m c^2)^2 + (p c)^2$ where momentum is set to zero, that is we not including a momentum for a mass at rest. The 4 vectors in special relativity are the x,y,z coordinates and time. The speed of light in effect converts space into time . So instead of dealing with a 3D momentum vector we are dealing with a 4D vector $P = (E / c, p)$, where P is the 4-D momentum and p is the regular (relativistic) 3D momentum, $p = \gamma m v$, E / c , is momentum in the time dimension. When an object is sitting still, it is still "moving" through spacetime, but its "motion" is pointed entirely in the time direction, instead of any of the three space directions. Normal momentum is computed as $p = m v$, so the equation $E = m c^2$ is the time analogue of $E / c = m c$. The extra c is just used to convert from the space dimension to the time dimension.

So what does this all mean? It means that energy does not have any mass and that energy and momentum are antilogs in spacetime. Things that have momentum; objects with mass will also have energy in the time component of the 4D vector. This also means that massless particles such as a photon have a time component in 4D and therefore also can have momentum.

This means that matter and energy are too very different animals until one is converted into the other.

According Einsteins equation how much energy is in 210 grams?

1.8874e+16 joules

The energy density (measured in units of joules per kilogram, symbol J/kg) of dynamite is approximately 5.0 MJ/kg for dynamite therefore .210Kg of dynamite would release 1.05e+6 joules of energy.

The complete conversion of .210kg of matter to energy is 17975238095.2381 times greater than the chemical potential energy released in the chemical reaction involved in the decomposition of NitroGlycerin.

So what am I driving at?

The individual above also believes in the 1907 “experiment” done by Duncan "Om" MacDougall where he supposedly measured the mass change in an individual at the moment of death to be 210 grams in response to the release of the soul. We have to assume that if souls existed they would only be made up of pure energy otherwise the matter could be identified and measured. However if 210 grams of body mass was converted into the energy of a “soul” at the time of death you have a small thermonuclear explosion; the release of energy equivalent to 17975238095.2381 sticks of dynamite. Since this didn't happen we can only conclude that the 210 grams was not converted to energy and somewhere an experimental error was made. Remember this was 1907, and the experimenter was biased. The whole premise is ridiculous, even if there was a proven correlation with death and a mysterious loss of mass it does not mean that it would have any association with the release of a



soul, it would just mean that there is some phenomena that needs investigated. You can't just arbitrarily decide what the phenomena would be associated with. This is why we have the scientific method. Another essay in science to ignore.